

# Factors Influencing Green Warehouse Practices in Malaysian Warehouse Industry: An Empirical Analysis

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## Abstract

The purpose of this study is to provide an understanding of the factors influencing green warehouse practices (GWP) in the Malaysian warehouse industry. Both stakeholder theory (ST) and institutional theory (IT) act as the foundation in developing the theoretical framework. Six factors were identified resulted from preliminary data gathering and an extensive literature review for constructing the model. The sample size consists of 226 respondents with the acceptance rate of 89 per cent. The findings revealed that customer demand, owner support, employee involvement, top management commitment, industry competition, and governmental pressure are positively associated with GWP. Based on the findings, warehouse companies and relevant authorities in Malaysia should focus on the importance of GWP towards becoming more competitive in the global market. The study provides a theoretical gap by proposing a valuable implication to scholars and practitioners in promoting sustainable industrial development which aligns with the government national agenda.

**Keywords:** Warehouse; Green Warehouse; Industrial Development; Sustainability

## Introduction

The concept of the green warehouse is derived from the green logistics and supply chain management (LSCM) concept. A large and growing body of literature has explored the green LSCM practices as the measurement to minimize the ecological impact (Green *et al.*, 2012). With the astounding improvement in the import and export activities, warehouse operations play a very important function in logistics activities (Third Industrial Master Plan 2006-2020, 2006). Nevertheless, the overall warehouse operations are negatively affecting the environment, thus, the concept of green warehouse pledged to reduce the carbon emissions. The need for Green Warehouse Practices (GWS) are important globally which seen can reduce the pollution and eventually lessen the greenhouse gas emission (Intergovernmental Panel on Climate Change, 2014).

For the past few years, there have been a number of significant research being done with regards to the needs of the green industrial building practices by focusing on the issues, importance and contribution in the organisations as a whole (Fichtinger *et al.*, 2015; Singh & Trivedi, 2015). Fichtinger *et al.* (2015) in their study identified that GWP is an important element in the overall logistics system after transportation services. Roy (2010) claimed not only commercial, a building to support the import and export transaction which refer as warehouse also need to implement a green concept.

GWP is relatively a new concept in Malaysia as statistics from Green Building Index (GBI) show limited green warehouses in Malaysia have been built. In Malaysia, GWP is still in the infant stage. While fascinating and explanatory, the past literature has identified shortcomings in GWP. Previous studies focused more on factors affecting green building and logistics (Green *et al.*, 2012), limited to warehouse practices. There are few studies being done with regards to GWP which include a study by Amjed *et al.* (2013) which focuses on the best practices and sustainable warehouse modelling. The

factors influencing GWP is rarely explicitly addressed. Thus, the purpose of this study is to develop a theoretical framework to better understand factors influencing GWP based on two prominent management concepts of ST and IT.

This paper consists of seven parts. First, it reviews extensively literature relevant to the related theories adopted for this study prior to the development of theoretical research framework. Secondly, factors influencing GWP is presented and the hypothesis is developed. The third section discusses the research methodology that is employed to attain the objectives of this research. The next part of the research paper is the discussion on the results and findings of the research. This paper also discusses the theoretical and managerial implication. Research limitation and future studies are elaborated in the last section before it is concluded with a summary of the study and directions for future research.

### Theoretical Background and Research Framework

Two strategic management theories particularly ST and IT have been employed in this study. A number of studies have found that an organization may survive and gain greater freedom with support from various stakeholders (Wahab *et al.*, 2018; Clark *et al.*, 2014; Ala-Arja & Helo, 2014). This study attempts to integrate both theories in order to obtain a comprehensive understanding of how both internal and external factors would influence the adoption of GWP.

For the past three decades, ST receives much attention and is widely known as a theory to explain the possible factors for the organisations to adopt various environmental practices which include GWP. According to Freeman (1984), ST glimpse at any group or individual who is affected or can affect the practices, implementation, achievement, decisions or future direction of an organisation endurance. Without the support of stakeholders, there is no reason for an organisation to exist. In view of GWP, it requires commitment and full support from both internal and external stakeholder.

An external stakeholder is a secondary group of people that are not part of the organisation but represent the outside parties which affect or get affected by the organisation business activities. Entrenched by DiMaggio and Powell (1983), the IT interpreted the actions and commitments undertakes by the organisation to react to the pressure and expectation from the external environments in gaining the market recognition, support and legitimacy. This theory exists because of the organisation operations are heavily bound by rules, regulations and policies. Thus, this theory is used to support the theoretical model of GWP.

On the basis of a theoretical argument presented, this study attempts to express the role of stakeholders in empowering GWP. The theoretical framework development provides an overview of multiple stakeholders in glaring the GWP which draw from both ST and IT simultaneously. The framework proposes how various stakeholder plays an important role in the GWP. Figure 1 illustrates the possible contribution towards GWP from the view of various stakeholders.

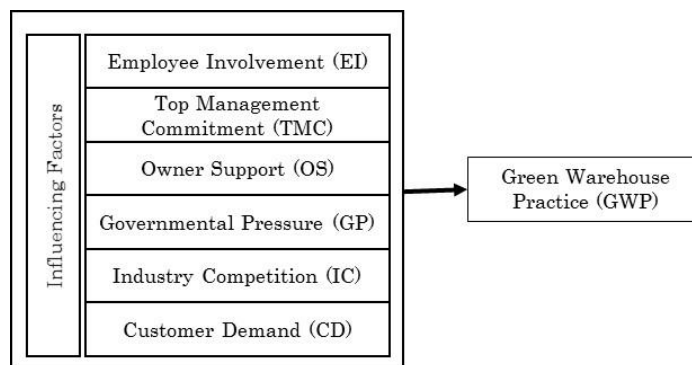


Fig. 1 Research Framework

## Literature Review and Hypothesis Development

Stakeholders greatly influenced the green practices in an organisation. Aforementioned group of people can influence and can be influenced by the success or failure of the organization. The green practices are not solely relying on the internal stakeholder, but also influenced by the external stakeholder. Undoubtedly, companies that face greater stakeholder's pressure tend to adopt green practices more quickly (Clark *et al.*, 2014, Green *et al.*, 2012; Freeman, 1984; DiMaggio and Powell, 1983). In line with the above opinion, multiple factors were identified influencing the GWP. These factors are discussed in the next section.

### *Employee Involvement*

An employee is a group of people dealing with daily production activities. They urge for cleaner production and prefer to work with a greener environment organization. It is a necessity and become a trend working in an organisation with a greener environment. Obviously, it may enhance employee comfort and health which may improve the motivation and leads to company profitability (Kalamas *et al.*, 2013). Most of the organisations nowadays not only concern about creating profit for their business but drawing attention to their employees' goodwill and job satisfaction towards better culture and group-oriented teamwork creation (Wahab *et al.*, 2018; Clark *et al.*, 2014). Thus, the satisfaction of employees should be met in order to encourage and motivate the employees to contribute their commitment to greener practices. Hence, employee involvement will encourage an organisation to implement green practices.

### *Top Management Commitment*

Top management is a person that is responsible for managing the entire management and being a driving force towards the green practices implementation. A positive attitude, clear visions, authoritative leadership, precise strategic intents and profoundly committed is mandatory for all top management personnel to implement GWP. Organizational support in providing the necessary resources is essential in adopting GWP which includes technology adoption. This group of personnel is pledged to allocate the required resources efficiently towards the creation of GWP sustainable competitive advantage (Wahab *et al.*, 2018; Ala-Arja & Helo, 2014). Sufficient organizational resources and adequate organizational learning capabilities will determine the success of the organization in implementing GWP. Training and development are one of the fundamental intensives from the top management in excelling the employee's skill and encourage them to involve in the GWP. Through it, employees will have higher innovative capacities and capabilities that can advance the GWP (Green *et al.*, 2012).

### *Owner Support*

Owner or shareholder is the individual who owns and hold a significant share of the organisation. This group of people is the most silent stakeholder but they are the person who owns the total impacts towards the organisation future direction and strategy. According to Weng & Lin (2011), a positive attitude toward environmental concern will reflect the direction of the organisation to perform more competitive business. Additionally, owner or shareholder plays an important role to support the decision from the top management. Wahab *et al.*, 2018 and Meixell & Luoma (2014) highlighted that the owner has an absolute power to influence the overall decision of the entire business operations. Well-Founded planning from the top management required sustenance from the owner both moral and financial support. Without fully support from the firm owner, the GWP cannot be successfully implemented. Thus, the owner must partake a positive mindset and further conscious of the environmental issue towards the successful of GWP.

### *Governmental Pressure*

Government is the main body that guides and controls organisations towards adopting a green practice through specific rules and regulations. Apart from tax or subsidies, stamp duty exemption, financial incentive, pilot projects, training programs and the availability of external resources will influence the adoption of green practices. This initiative of the behavioural shift will reduce waste, reduce carbon emissions and promote the use of renewable energy (Zainul Abidin & Powmya, 2014). As a regulator, the government's role to improve and enforce sustainable-related regulations will bring changes at the national level. Pressure from the government becomes the main reason organisations moving towards green practices. Country development is much influenced by government institutions (Wahab *et al.*, 2018; Laosirihongthong *et al.*, 2013). The absence of a legislative instrument of sustainable development in most developing countries is a factor that negatively affects GWP. Proper legislation enforcement will support GWP.

### *Industry Competition*

The competitor is defined as a rival who competes for market penetration and resources. ST perceives green practices as the tool to enhance an organisation's green reputation, improve efficiency and service quality towards better competitive advantage (Wahab *et al.*, 2018; Hwang and Min, 2015). An earlier study by Carter and Jennings (2002) highlighted for the organisation to gain competitive advantages, green practices are great weapons to win over the competitors. Technology innovation which includes the Internet of Things (IoT) application in GWP is a strategy that makes a company like Amazon, DHL and the like sustained (Supply Chain Digital, 2017). Large and successful organisations will usually face tight competition from their competitors in the same businesses. The environmental pressure has motivated organisations to self-regulate. The competitor evaluation is utmost important apart from being continuously innovative in introducing new initiatives towards best green practice. By taking a proactive green practices approach, organisations can address current and evolving environmental challenges.

### *Customer Demand*

In any part of the world, educated and high level of awareness customers may prefer green products or services. According to Laosirihongthong *et al.* (2013), more than 75 per cent of customers demand greener products and services towards better environmental creation. Customer demand and feedback has become the most significant type of external pressure (Wahab *et al.*, 2018; Solakivi, 2014). In Malaysia, pro-environmental behaviour plays a vital role in promoting green practices. The awareness towards green practices is growing in Malaysian logistics industry due to customers who prefer to opt the green products or services and are expecting a green standard in any products or services that they are interested. Customers are more knowledgeable and start questioning the nature of products or services that they buy in relation to a greener environment. Thus, customers demand would influence the organization's decision towards GWP.

## **Research Methodology**

In order to determine the relationship between employee involvement, top management commitment, owner support, governmental pressure, industry competition and customer demand on GWP, a quantitative method has been chosen for this study. Individuals at the managerial level from the logistics firm which operates warehouse services will be the target respondents. Data collection is based on simple random sampling to ensure the accuracy of representation. In order to ensure the effectiveness of the data collection, a pre-test was conducted among the 36 warehouse practitioners. From the result, the actual data collection was conducted by using both drop and collect method

besides online survey. The data collected were then analyzed using reliability analysis, Pearson's correlation analysis and multiple regression analysis.

**Results and Discussion**

*Response Rate*

A total of 160 questionnaires were distributed using drop and collect method. Among that, 148 questionnaires were returned with only 132 questionnaires valid for analysis. In addition, a total of 94 responded using an online form which makes a total of 226 (89%) data collected and ready for further analysis. The high percentage responded may be due to the drop and collect method used which requires the researcher to identify the respondent earlier.

*Demographic Profile of Respondents*

The result from Table 1 shown that out of 226 respondents, 222 respondents were holding higher managerial position (98.2%), while, the remaining 4 respondents were at assistant manager level (1.8%). This analysis supports the previous study done by Sayuti (2013) where the higher managerial position was more likely to provide more accurate feedback towards the overall GWP. As for the entire sample, 15% of the respondents were having less than 5 years of managerial experience. With regards to their type of organization, a large portion of them are from Malaysian company (65.5%) with more than 20 operating years (65%) which majority of the respondents came from the organization that has employees more than 451 (37.2%).

Table 1: Demographic Profile of Respondents

Demographic Variables	Details	Frequency	Percentage (%)
Position in the Organisation	Owner	5	2.2
	CEO / President	33	14.6
	Director / Deputy Director	67	29.6
	Senior Executive Officer / Manager	90	39.8
	Assistant Manager / Supervisor	27	11.9
	Others	4	1.8
Managerial Experience	Yes	222	98.2
	No	4	1.8
Years of Managerial Experience	Less than 5 year	34	15
	6 – 10 years	75	33.2
	11 – 15 years	31	13.7
	16 – 19 years	29	12.8
	More than 20 years	57	25.2
Type of Organization	Foreign-based Multinational Company	78	34.5
	Malaysian owned Multinational Company	89	39.4
	Small and Medium-sized Enterprises	59	26.1
Organization Operating Years	Less than 5 years	15	6.6
	6 – 10 years	32	14.2
	11 – 15 years	24	10.6
	16 – 19 years	8	3.5
	More than 20 years	147	65
Number of Employees	Less than 50 employees	45	19.9
	51 – 150 employees	25	11.1
	151 – 250 employees	22	9.7
	251 – 350 employees	36	15.9
	351 - 450 employees	14	6.2
	More than 451 employees	84	37.2

*Reliability*

To identify the reliability of the instruments used, the measurement of Cronbach's alpha is tested. Based on the rule-of-thumb, a scale is considered reliable when Cronbach's alpha exceeds the threshold value of 0.7. From Table 2, Cronbach's alpha for all the constructs for this study surpassed

the 0.7 thresholds, thus indicated a good internal consistency among the contracts items (Hair *et al.*, 2010) to measure the factors influencing GWP.

Table 2: Reliability Analysis

Construct	Cronbach's Alpha
Employee Involvement	0.835
Top Management Commitment	0.854
Owner Support	0.773
Government Pressure	0.822
Industry Competition	0.864
Customer Demand	0.801
Green Warehouse Practices	0.816

### Correlation Analysis

In order to determine the bivariate relationship among independent variables and a dependent variable, Pearson correlation analysis is used (Field, 2005). To avoid multicollinearity, the correlation coefficient should be 0.8. The correlation matrix in Table 3 shows that there is a no multicollinearity issue between the six independent variables and dependent variable. Top management commitment ( $r=0.523$ ,  $r>0.5$ ) and customer demand ( $r=0.598$ ,  $r>0.5$ ) have a positive and strong relationship with GWP. Meanwhile, employee involvement ( $r=0.361$ ,  $r>0.3$ ), owner support ( $r=0.392$ ,  $r>0.3$ ), governmental pressure ( $r=0.331$ ,  $r>0.3$ ) and industry competition ( $r=0.485$ ,  $r>0.3$ ) have a moderate and positive relationship with GWP (Pallant, 2011).

Table 3: Pearson Correlation Analysis of the Independent Variables

	EI	TMC	OS	GP	IC	CD	GWP
EI	-						
TMC	.569**	-					
OS	.522**	.685**	-				
GP	.294**	.358**	.360**	-			
IC	.206**	.281**	.314**	.346**	-		
CD	.280**	.481**	.264**	.403**	.502**	-	
GWP	.361**	.523**	.392**	.331**	.485**	.598**	-

Note: \*\*Correlation is significant at the 0.01 level (2-tailed)

\*Correlation is significant at the 0.05 level (2-tailed)

### 5.5. Multiple Regression Analysis

To predict the value of more than two variables, multiple regression is being applied (Hair *et al.*, 2010). The R-value from Table 4 represents the simple correlation and the result is 0.688, which indicates quite a respectable result of the correlation between the independent variable and dependent variable. In addition,  $R^2$  indicates 47.4% of the GWP can be explained through the changes in the six independent variables.

From the regression analysis in Table 4, all variables supported the GWP namely, H1 employee involvement ( $\rho=0.002$ ), H2 top management commitment ( $\rho=0.004$ ), H3 owner support ( $\rho=0.000$ ), H4 governmental pressure ( $\rho=0.015$ ), H5 industry competition ( $\rho=0.037$ ) and H6 customer demand ( $\rho=0.000$ ). From the result, customer demand and owner support have the highest influential factors towards GWP. It can be concluded that GWP can be materialised if warehousing companies in Malaysia are more concerned with customer demand. This is in line with the previous research done by Solakivi (2014) which claimed customers may influence the company decision. Thus, it is a must for a firm to improve its services in order to improve the company reputation, efficiency and service quality towards better competitive advantage (Wahab *et al.*, 2018; Hwang and Min, 2015).

Table 4: Result of Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	$\beta$	t	
(Constant)	0.844	0.088		3.404	0.001
EI	0.243	0.091	0.240	3.173	0.002
TMC	0.206	0.101	0.228	2.846	0.004
OS	0.405	0.071	0.420	3.627	0.000
GP	0.102	0.089	0.102	1.635	0.016
IC	0.163	0.111	0.169	2.075	0.032
CD	0.749	0.030	0.748	4.346	0.000
R	0.688				
R Square	0.474				
Adjusted R Square	0.460				

\*Dependent Variable: Green Warehouse Practice

### Theoretical and Managerial Implication

From a theoretical perspective, this study provides several scholar implications. Firstly, this study successfully extends the ST and IT theory in the context of GWP. Secondly, this study provides significant findings on the existing warehouse literature on the factors affecting GWP that may encourage future researchers to extend the GWP research. From the result, all variables were found supported the GWP. However, there may be other significant factors that might influence GWP which requires further exploration.

Several important managerial implications from this study include an idea for the warehouse practitioners to focus more on the important influences from the customers, the owners of the firms as well as competitors towards successfully implement GWP. This study also provides an insight to the policymakers to promote sustainable industrial development which is in line with the government national agenda. To become more competitive in the market, a sustainable strategy is the greatest way to win the battle.

### Limitations and Future Studies

Several limitations from this study have been identified which may consider for future research. Firstly, the result obtained from this study is mainly from Malaysian warehouse industry which may differ from other industries in Malaysia. Hence, it is worth for future researchers to extend the study by expanding to different industries and also the geographical area. Next, this study only considers the ST and IT where other theories may also verify to determine the factors influencing GWP. A future study might need to incorporate other theories that might influence the GWP. Finally, this study employed quantitative approached by using SPSS, a future study may extend the finding using other statistical tools such as SmartPLS. Qualitative approach or the combination of both approaches may also be acquired.

### Conclusion

The present study is designed to develop a theoretical framework that ascertains numerous factors influencing GWP. Although there are a great number of publications and studies focus on green LSCM, the element of warehousing should not be neglected due to its imperative segment in logistics activities. This study set out to tie the theoretical gap and the uneven scope of research by exploring driving factors of GWP through the lens of two prominent management theories; ST and IT.

The idea discussed throughout this study extend GWP knowledge and contribute to the existing green LSCM body of literature. This study also serves as a basis for future studies and attracts more academic arguments to further fine-tune the suggested hypotheses. It will be interesting to validate the concept through case studies. Further research needs to be done to validate the result of this study. Broadly, insights from practitioners and academicians are highly encouraged in extending the theoretical model.

## References

- Ala-Harja, H. & Helo, P. (2014). Green supply chain decisions—Case-based performance analysis from the food industry. *Transportation Research Part E: Logistics and Transportation Review*, 69, 97-107.
- Amjed, T. W., & Harrison, N. J. (2013). A Model for sustainable warehousing: from theory to best practices. In A. E. Avery (Ed.), *2013 International DSI and Asia Pacific DSI Conference proceedings*, pp. 1892-1919. United States: Decision Sciences Institute.
- Carter, C.R. and Jennings, M.M. (2002). Logistics social responsibility: an integrative framework. *Journal of Business Logistics*, 23 (1), pp. 145-180.
- Clark, J.W., Toms, L.C. and Green, K.W. (2014). Market-oriented sustainability: moderating impact of stakeholder involvement. *Industrial Management & Data Systems*, 114 (1), pp. 21-36.
- DiMaggio, P.L. and Powell, W.W. (1983). The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48, pp. 147-160.
- Englewood Cliffs, NJ: Pearson Prentice-Hall, 2005.
- Fichtinger, J., Ries, J. M., Grosse, E. H., Baker, P. (2015). Assessing the environmental impact of integrated inventory and warehouse management. *Int. J. Prod. Econ.*, 170, pp. 717–729.
- Field A., *Discovering Statistics Using SPSS*, 2nd ed., London: Sage, 2005.
- Freeman, R.E. (1984), *Strategic Management: A Stakeholder Approach*, Pitman, Boston, MA.
- Green, K.W., Zelbst, P.J., Meacham, J. and Bhadauria, V.S. (2012). Green supply chain management practices: impact on performance. *Supply Chain Management: An International Journal*, 17 (3), pp. 290-305.
- Hair, J. F. Jr., Anderson, R. E., Tatham, R. L. & Black, W. C. (2010). *Multivariate Data Analysis: A Global Perspective (7<sup>th</sup> ed.)*. Pearson Prentice Hall, New Jersey.
- Hwang, D. and Min, H. (2015). Identifying the drivers of enterprise resource planning and assessing its impacts on supply chain performances. *Industrial Management & Data Systems*, 115 (3), pp. 541-569.
- Intergovernmental Panel on Climate Change (2014). Retrieved January 8, 2016 from <http://www.ipcc.ch/>
- Kalamas, M., Cleveland, M., & Laroche, M. (2013). Pro-environmental behaviors for thee but not for me: Green giants, green Gods, and external environmental locus of control. *Journal of Business Research*, pp. 1–10.
- Laosirihongthong, T., Adebajo, D. and Tan, K.C. (2013). Green supply chain management practices and performance. *Industrial Management & Data Systems*, 113 (8), pp. 1088-1109.
- Meixell M. J. and Luoma P. (2015). Stakeholder pressure in sustainable supply chain management: A systematic review. *International Journal of Physical Distribution & Logistics Management*, 45 (1/2), pp.69-89
- Roy, M. (2010). Green Warehouse. *ASHRAE Journal*, pp. 64-70
- Sayuti N.M. (2013). Antecedents of supply chain relationships between MNC's and SME's in agile environment, PhD Thesis, RMIT University. pp. 185-186.
- Singh, A., and Trivedi, A. (2016). Sustainable green supply chain management: trends and current Practices. *Competitiveness Review*, 26 (3), pp. 265 – 288
- Solakivi, T. (2014). The Connection between Supply Chain Practices and Firm Performance – Evidence From Multiple Surveys and Financial Reporting Data, Master's Thesis, University of Turku, pp. 1-76



- Supply Chain Digital (2017). Online. Retrieved February 10, 2017 from <http://www.supplychaindigital.com/>
- Third Industrial Master Plan 2006-2020 (2006). The Ministry of International Trade and Industry or MITI, Malaysia.
- Wahab, S.N., Sayuti, N.M. and Talib, M.S.A. (2018) 'Antecedents of Green Warehousing: A Theoretical Framework and Future Direction', *International Journal of Supply Chain Management*, Vol. 7(6), pp. 382-388
- Weng, M. H. and Lin, C. Y. (2011). Determinants of green innovation adoption for small and medium-size enterprises (SMES). *African Journal of Business Management*. 5 (22), pp. 9154-9163
- Zainul Abidin, N. and A. Powmya, (2014). GreenConstruction in Oman: Progress and Implementation Barriers, In the Proceedings of the 2013 Sustainable Building Conference, Dubai, UAE, 8-9 Dec.